

Telephone Cable Maintenance - NonHardened Section

1. Mission Statement. Nonhardened Cable Maintenance maintains all nonhardened cable systems to provide command and control and administrative telephone service for the objective wing including all active duty military, Air National Guard, Reserve, Department of Defense, and non-appropriated fund organizations. It is responsible for preliminary troubleshooting, repair, installation, removal, reports and preventive maintenance of nonhardened cable systems.

2. Authority. The 21- series of Air Force Instructions (AFI) contains responsibilities, policy, and procedural guidance for the Nonhardened Cable section. This standard was developed in accordance with policy and procedures contained in AFMAN 38-208.

3. Applicability. This section applies to all objective wing Nonhardened Cable Elements in AMC, ACC, USAFE, PACAF, and AETC UPT bases during peacetime. It does not apply to:

3.1. Air National Guard or Air Force Reserve installations.

3.2. Combat Communications Units.

3.3. Locations undergoing AFI 38-203 cost comparison studies.

3.4. Locations that have completed AFI 38-203 cost comparison studies. Both a positive and negative mission variance must be developed for all work within the organization that has undergone a cost comparison study.

4. Core Composition. The following factors were considered to determine the core manpower required for Nonhardened Cable Maintenance:

4.1. An objective wing population of 3,055, 72 Primary Aircraft Assigned, located on a base comprising 3500 acres, and assumes a flying mission. To support this mission, buried/underground, nonpressurized, filled cable, to include fiber, and spared at 40% is needed.

4.2. The level of service, provided to support wing flying hours of 16- hours per day, 7-days per week, is single shift maintenance of 40-hours per week, with on call maintenance for unscheduled outages.

4.3. Restoral priorities will be established and followed when personnel respond to multiple outages.

4.4. Indirect work involves those tasks that are not readily identifiable with the work center's specific product or service. The major categories of standard indirect work are Supervision, Administration, Meetings, Training, supply, Equipment Maintenance, and Cleanup. Core man-hours for indirect work are computed in with the processes.

4.5. Core Manpower Required. 4

4.6. Core Range. 2-50 authorizations

4.7. Programming factor. Cable Pair Miles.

5. Core Composition Variables. The following factors need to be considered to determine changes to the core composition:

5.1. Increased authorizations in wing population are assumed to support an increase of aircraft assigned. These increases are also assumed to increase at a rate of 24 aircraft, and their associated manpower, at a time. Incremental increases in numbers of aircraft will generate an increase in wing population which requires cable for their telephone numbers. This will require additional manpower to support this increase of wing population.

5.2. Other increases to wing population that are not aligned with the wing's original mission, support and flying of 72 Primary Aircraft Assigned, will be handled as a variance.

6. Standard Data:

6.1. Classification. Type III

6.2. Approval Date. 1 March 1993

6.3. Man-Hour Data Source. Workshop Measurement

6.4. Man-Hour Equation. Refer to core matrix (Attachment 5).

6.5. Workload Factor.

6.5.1. Title: Cable Pair Miles (CPM).

6.5.2 Definition: The range of non-pressurized, buried cable pair miles maintained by the element.

6.5.3. Source: Communications-Computer Systems Records (CSIRs) and Cable Maintenance Workload Data Collection Worksheets maintained by the work center. When computing cable pair miles for fiber optic cable, cables with less than 24 strands will be equated to 100 pair copper cables, cable strands between 24 and 100 will be equated to 300 pair copper cable, and fiber cables larger than 100 strands will be equated to 900 pair copper cable.

6.6. Study Team.

6.6.1. Lead Technicians: Capt Sarah Dahm and Mr George Nelson (AFCOMMET/MOMC).

6.6.2. Functional Representatives: CMSgt Ward (AFC4A/SYVS) and SMSgt Greene (Det 1, CSC).

6.6.3. Program Manager. MSgt Deas (HQ AFMEA/MEMS)

7. Application Instructions for Core Cable Composition.

7.1. Step 1. If all your cable is buried/underground, non- pressurized and filled, then use the core matrix (Attachment 5).

7.2. Step 2. Determine the Cable Pair Mile (CPM) Range that applies to your base.

7.3. Step 3. The manpower number next to the applicable CPM Range is your manpower.

7.4. Step 4. Determine variance manpower applicable to your location (variances 3-4, Ref Attachment 3).

7.5. Step 5. Add/Subtract variance manpower from step 4 to the manpower obtained in step 3. This is your total manpower.

8. Application Instructions for Variance Cable Composition.

8.1. Step 1. If your cable is a mixture of aerial, buried and underground, then use either the "Majority Pressurized" matrix (Attachment 6) or "Majority Non-Pressurized" matrix (Attachment 7).

8.2. Step 2. Determine the Cable Pair Mile (CPM) Range that applies to your base.

8.3. Step 3. The manpower number next to the applicable CPM Range is your manpower.

8.4. Step 4. Determine variance manpower applicable to your location (variances 3-4, Ref Attachment 3).

8.5. Step 5. Add/Subtract variance manpower from step 4 to the manpower obtained in step 3. This is your total manpower.

9. Statement of Conditions. This work center is significantly impacted by conditions beyond managerial control. Specific impacts are listed below. These impacts are incorporated in the computations of this standard.

9.1. Climatic Conditions:

9.1.1. Temperature. Extreme hot or cold temperatures lengthen the maintenance time.

9.1.2. Precipitation. Snow, ice, rain, or humidity increases maintenance for corrosion control.

9.2. Physical Conditions. Older cable requires more maintenance.

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1. Element Description
2. Standard Manpower Table
3. Variances
4. Process Analysis Summary
5. Core matrix
6. Majority Pressurized Matrix
7. Majority Non-pressurized Matrix

ELEMENT DESCRIPTION**Telephone Cable Maintenance - NonHardened Section****1. MAINTAINS BURIED/UNDERGROUND CABLE MAINTENANCE (NONPRESSURIZED AND FILLED).**

Completes documentation; coordinates with appropriate agency; receives instruction; reviews technical data; obtains tools, test equipment, and material; reviews schedule/listing; on loads/off loads vehicle; prepares work area; performs associated repair, which includes trouble-shooting, locating problem area, excavating splice area, removing/replacing splice case and/or cable section; performing operational check and backfilling; restores work area; coordinates with appropriate agency; returns tools, test equipment, and material; prepares surface area, cleans and scrapes, as necessary, and applies protective coating; replaces cable tag, removes/replaces cable racking, repairs bonding/grounding, replaces/repairs tape wrap, repairs cable sheath, and plugs duct; corrects terminal stenciling, repairs terminal ground, replaces carbon block, secures cable/terminal, and cleans terminal.

2. PERFORMS INSTALLATION QUALITY CONTROL INSPECTION. Completes documentation coordinates with appropriate agency; receives instruction; reviews technical data; obtains tools, test equipment, and material; reviews schedule/listing; on loads/off loads vehicle; prepares work area; orders locally procured material and ensures site concurrence letter requirement is met prior to scheme start; ensures Engineering-Installation Team electrical and pressure check on cable is completed; restores work area; coordinates with appropriate agency; and returns tools, test equipment, and material.

3. MAINTAINS COMMUNICATIONS-COMPUTER SYSTEMS RECORD (CSIR). Identifies affected drawing and reviews for accuracy; makes correction, forwards to appropriate agency, and reviews and files corrected drawing.

4. PROCESS DIGGING PERMITS. Processes appropriate form and forwards to Base Civil Engineering prior to any maintenance performed on buried cable system; reviews appropriate form, identifies appropriate drawing, determines necessary action, completes appropriate portion of form; receives notification that outside agency is beginning to dig; reviews drawing; hooks up tone; traces and stakes cable to prevent damage; monitors digging, if required; and points out cable stake.

5. PERFORMS TRAVEL. Performs associated travel to and from job site or from job site to job site.

6. PERFORMS MINOR INSTALLATION/REMOVAL. Receives and reviews job to determine job requirements; coordinates with and assists appropriate agency; obtains and reviews applicable directive; obtains test equipment, tools, material, and spare parts; on loads/off loads vehicle; and prepares work area; Installs or removes applicable new cable; removes and installs existing local unit level cable; and resets, aligns, adjusts, calibrates, lubricates, cleans, treats for corrosion, and accomplishes performance check; cleans work area; stores tools, material, technical data and equipment; and completes documentation.

STANDARD MANPOWER TABLE											
WORK CENTER/FAC			APPLICABILITY MAN-HOUR RANGE								
Telephone Cable Maintenance - Nonhardened Section/38AK			321.40 - 8035.00								
AIR FORCE SPECIALTY TITLE	AFSC	GRADE	MANPOWER REQUIREMENT								
Communication-Cable and Antenna Systems Supt	2E690	SMS									
Communication-Cable Sys Crftmn	2E672	MSG								1	1
Communication-Cable Sys Crftmn	2E672	TSG			1	1	1	1	1	1	1
Communication-Cable Sys Jrnymn	2E652	SSG		1	1	1	1	1	1	1	2
Communication-Cable Sys Jrnymn	2E652	SRA		1	1	1	1	2	2	2	2
Communication-Cable Sys Apr	2E632	A1C				1	2	2	3	3	3
TOTAL				2	3	4	5	6	7	8	9
AIR FORCE SPECIALTY TITLE	AFSC	GRADE	MANPOWER REQUIREMENT								
Communication-Cable and Antenna Systems Supt	2E690	SMS									
Communication-Cable Sys Crftmn	2E672	MSG	1	1	1	1	1	1	1	1	1
Communication-Cable Sys Crftmn	2E672	TSG	2	2	2	2	2	2	3	3	3
Communication-Cable Sys Jrnymn	2E652	SSG	2	2	2	3	3	3	3	4	4
Communication-Cable Sys Jrnymn	2E652	SRA	2	2	3	3	3	4	4	4	4
Communication-Cable Sys Apr	2E632	A1C	3	4	4	4	5	5	5	5	6
TOTAL			10	11	12	13	14	15	16	17	18

STANDARD MANPOWER TABLE											
WORK CENTER/FAC			APPLICABILITY MAN-HOUR RANGE								
Telephone Cable Maintenance - Nonhardened Section/38AK			321.40 - 8035.00								
AIR FORCE SPECIALTY TITLE	AFSC	GRADE	MANPOWER REQUIREMENT								
Communication-Cable and Antenna Systems Supt	2E690	SMS		1	1	1	1	1	1	1	1
Communication-Cable Sys Crftmn	2E672	MSG	1	1	1	1	2	2	2	2	2
Communication-Cable Sys Crftmn	2E672	TSG	3	3	3	3	3	3	3	3	3
Communication-Cable Sys Jrnymn	2E652	SSG	4	4	4	5	5	5	5	6	6
Communication-Cable Sys Jrnymn	2E652	SRA	5	5	5	5	5	6	6	6	7
Communication-Cable Sys Apr	2E632	A1C	6	6	7	7	7	7	8	8	8
TOTAL			19	20	21	22	23	24	25	26	27
AIR FORCE SPECIALTY TITLE	AFSC	GRADE	MANPOWER REQUIREMENT								
Communication-Cable and Antenna Systems Supt	2E690	SMS	1	1	1	1	1	1	1	1	1
Communication-Cable Sys Crftmn	2E672	MSG	2	2	2	2	2	2	2	2	2
Communication-Cable Sys Crftmn	2E672	TSG	3	3	4	4	4	4	4	4	4
Communication-Cable Sys Jrnymn	2E652	SSG	6	7	7	7	7	8	8	8	9
Communication-Cable Sys Jrnymn	2E652	SRA	7	7	7	7	8	8	8	9	9
Communication-Cable Sys Apr	2E632	A1C	9	9	9	10	10	10	11	11	11
TOTAL			28	29	30	31	32	33	34	35	36

AF Form 1113, JUN 91 (COMPUTER GENERATED). PREVIOUS EDITION IS OBSOLETE.

STANDARD MANPOWER TABLE											
WORK CENTER/FAC			APPLICABILITY MAN-HOUR RANGE								
Telephone Cable Maintenance - Nonhardened Section/38AK			321.40 - 8035.00								
AIR FORCE SPECIALTY TITLE	AFSC	GRADE	MANPOWER REQUIREMENT								
Communication-Cable and Antenna Systems Supt	2E690	SMS	1	1	1	1	1	1	1	1	1
Communication-Cable Sys Crftmn	2E672	MSG	2	2	2	2	2	2	2	2	2
Communication-Cable Sys Crftmn	2E672	TSG	4	4	4	4	4	4	4	4	4
Communication-Cable Sys Jrnymn	2E652	SSG	9	9	10	10	10	11	11	11	12
Communication-Cable Sys Jrnymn	2E652	SRA	9	10	10	10	11	11	11	12	12
Communication-Cable Sys Apr	2E632	A1C	12	12	12	13	13	13	14	14	14
TOTAL			37	38	39	40	41	42	43	44	45
AIR FORCE SPECIALTY TITLE	AFSC	GRADE	MANPOWER REQUIREMENT								
Communication-Cable and Antenna Systems Supt	2E690	SMS	1	1	1	1	1				
Communication-Cable Sys Crftmn	2E672	MSG	2	2	2	2	2				
Communication-Cable Sys Crftmn	2E672	TSG	4	4	4	4	4				
Communication-Cable Sys Jrnymn	2E652	SSG	12	12	13	13	13				
Communication-Cable Sys Jrnymn	2E652	SRA	12	13	13	13	13				
Communication-Cable Sys Apr	2E632	A1C	15	15	15	16	16				
TOTAL			46	47	48	49	50				

VARIANCES

Telephone Cable Maintenance - NonHardened Section

1. POSITIVE TECHNOLOGICAL VARIANCE FOR VARIED CABLE TYPES, MAJORITY PRESSURIZED.

1.1. DEFINITION. Completes documentation; coordinates with appropriate agency; receives instruction; reviews technical data; obtains tools, test equipment, and material; reviews schedule/listing; on loads/off loads vehicle; and prepares work area; performs associated repair, which includes troubleshooting, locating problem area, removing/replacing splice case and/or cable section, and performing operational check; performs cable air dryer maintenance; performs preventive maintenance inspection and mobile depot maintenance (MDM) quality control inspection; sets up safety cone/barrier, opens lid, places manhole guard around opening, pumps water out as required, performs toxic combustible gas test, ventilates manhole as required, sets up blower for heat or system cooling as required, and sets up manhole tent/lighting system as required; takes down associated equipment, replaces lid, and picks up safety cone/barrier; performs associated MDM support action, as directed, restores work area; completes documentation; coordinates with appropriate agency; and returns tool, test equipment, and material; prepares surface area, cleans and scrapes, as necessary, and applies protective coating; replaces pressure tag and valve cap; and repairs/replaces valve core and riser; replaces cable tag, corrects terminal stenciling, repairs terminal ground, replaces carbon block, secures cable/terminal, and cleans terminal.

1.2. IMPACT. +2 Manpower Authorizations.

1.3. APPLICABILITY. This variance supports those bases with a mixture of aerial, buried, and underground cable, where the majority of this cable is pressurized. Use the "Majority Pressurized" Matrix to determine manpower.

2. POSITIVE TECHNOLOGICAL VARIANCE FOR VARIED CABLE TYPES, MAJORITY NON- PRESSURIZED.

2.1. DEFINITION. Completes documentation; coordinates with appropriate agency; receives instruction; reviews technical data; obtains tools, test equipment, and material; reviews schedule/listing; on loads/off loads vehicle; and prepares work area; performs associated repair, which includes troubleshooting, locating problem area, removing/replacing splice case and/or cable section, and performing operational check; performs air dryer maintenance; performs preventive maintenance inspection and mobile depot maintenance (MDM) quality control inspection; sets up safety cone/barrier, opens lid, places manhole guard around opening, pumps water out as required, performs toxic combustible gas test, ventilates manhole as required, sets up blower for heat or system cooling as required, and sets up manhole tent and lighting system as required; takes down associated equipment, replaces lid, and picks up safety cone/barrier; performs associated MDM support action, as directed; restores work area; completes documentation; coordinates with appropriate agency; and returns tools, test equipment, and material; prepares surface area by cleaning and scraping as necessary, and applies protective coating; replaces pressure tag and valve cap, and repairs/ replaces valve core and riser; replaces cable tag, replaces missing/damaged hardware, relashes cable, repairs bonding, repairs cable sheath, adjusts strand tension, and repairs/ replaces tape wrap; corrects terminal stenciling, repairs terminal ground, replaces carbon block, secures cable/terminal, and cleans terminal.

2.2. IMPACT. +1 Manpower Authorization.

2.3. APPLICABILITY. This variance supports those bases with a mixture of aerial, buried, and underground cable, where the majority of this cable is non-pressurized. Use the "Majority Non-pressurized" Matrix to determine manpower.

3. POSITIVE MISSION VARIANCE FOR MARINE CABLE.

3.1. DEFINITION. This variance is for the manpower needed to maintain cable that supports the Marines. Pending ISSA, these positions will transfer to the Marines.

3.2. IMPACT. +18 Manpower Authorizations.

3.3. APPLICABILITY. This variance applies to Kadena until the Marine transfer occurs.

4. POSITIVE MISSION VARIANCE FOR E&I WORKLOAD.

4.1. DEFINITION. Provides manpower to do complete cable installations. This includes all necessary allied support, preparation of blue print drawings, verifying project material availability, ordering required material, inspecting allied support, installing new cables, trenching and backfilling as necessary, cleaning the work area, storing the tools, material, technical data, and equipment, and completing documentation.

4.2. IMPACT. +19 Manpower Authorizations.

4.3. APPLICABILITY. This variance applies to Kadena.

5. POSITIVE MISSION VARIANCE FOR PATRIOT MISSILE SUPPORT.

5.1. DEFINITION. Patriot Missile support for 1 military position provided by Inter-Service Support Agreement (ISSA) with the Army.

5.2. IMPACT. +1 Manpower Authorization.

5.3. APPLICABILITY. This variance applies to Bitburg AB.

PROCESS ANALYSIS SUMMARY**Telephone Cable Maintenance - NonHardened Section
(Underground/Buried, Non-Pressurized, Filled Cable)**

Process Title	PAT Core Manhours	Projected Workload	Fractional Manpower
Maintains Buried/ Undgrnd Non-Press, Cable	17	13	1.375
Performs Installation Quality Control Inspection	32	0.6	0.12
Maintains Comm- Computers Systems Records	2	11	0.137
Process Digging Permit	25	3	0.467
Performs Travel	0.1	2279	1.418
Minor Install/ Removal	100	0.33	0.205
	Total Fractional Manpower =		3.722

CORE MATRIX**Telephone Cable Maintenance - NonHardened Section****CORE (Underground/Buried, Non-Pressurized, Filled Cable)****APPLICATION MATRIX**

CPM	RANGE	TECHNICIANS
	0 - 11810	2
	11811 - 16374	3
	16375 - 21672	4
	21673 - 27779	5
	27780 - 34767	6
	34768 - 42676	7
	42677 - 51524	8
	51525 - 150000	9
	150001 - 250000	10

MAJORITY PRESSURIZED MATRIX**Telephone Cable Maintenance - NonHardened Section****APPLICATION MATRIX**

CPM	RANGE	TECHNICIANS
	0 - 2919	2
	2920 - 5262	3
	5263 - 8085	4
	8086 - 11487	5
	11488 - 15582	6
	15583 - 20505	7
	20506 - 26415	8
	26416 - 33451	9
	33452 - 50000	10
	50001 - 92500	11
	92501 - 135000	12
	135001 - 177500	13
	177501 - 220000	14
	220001 - 262500	15
	262501 - 305000	16
	305001 - 347500	17
	347501 - 390000	18
	390001 - 432500	19
	432501 - 475000	20
	475001 - 517500	21
	517501 - 560000	22
	560001 - 602500	23
	602501 - 645000	24
	645001 - 687500	25
	687501 - 730000	26
	730001 - 772500	27
	772501 - 815000	28
	815001 - 857500	29
	857501 - 900000	30
	900001 - 942500	31

MAJORITY NON-PRESSURIZED MATRIX**Telephone Cable Maintenance - NonHardened Section****APPLICATION MATRIX**

CPM	RANGE	TECHNICIANS
	0 - 4550	2
	4551 - 7895	3
	7896 - 11810	4
	11811 - 16374	5
	16375 - 21672	6
	21673 - 27779	7
	27780 - 34767	8
	34768 - 42676	9
	42677 - 51524	10
	51525 - 150000	11
	150001 - 250000	12